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The Labor Force Participation of Married Mothers in Spain and Britain

by

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Abstract

We explore the determinants of the relative probabilities of labor force participation for British and Spanish married (or cohabiting) mothers. We further decompose these probabilities and find a substantial cross-national gap in participation rates which can be predominantly explained by higher wages and greater child care use in Britain.

Key words: mothers, Britain, Spain, participation, JEL J2

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1 Introduction

The relative proportion of women to men participating in the labor force has been consistently smaller in Spain than it has in Britain. With the opening of the Spanish economy and the relaxation of the regime's moral controls in the 60's, the participation rates of Spanish women increased slightly but steadily. Since the first democratic elections in Spain, in 1979, the gap between Spain and Britain has been decreasing at a higher rate. Nevertheless, there still exists a substantial difference in female participation rates between Spain and Britain (Costa, 2000). This is especially true for married mothers, by the early 1990s some 55% of British married mothers were participating in the labor market whilst only some 32% of Spanish married mothers were.

In this paper we explore the determinants of the relative probabilities of labor force participation for British and Spanish married (or cohabiting) mothers. We further decompose these probabilities to consider the component due to differences in recognizable characteristics and that component associated with differences in response to these characteristics. In order to do so, we use individual data on British and Spanish family's members and implement a decomposition devised by Even and Macpherson (1990 and 1993) in their analysis of declining union membership. As the process of integration continues across these European countries, we also consider the implications of our results by indentifying how policy might increase the participation rate in Spain.

Explanation of the econometric framework is presented in section 2, the data sets are described in section 3, discussion and results of the probit models are provided in section 4, section 5 includes analysis of the labor force participation gap, and conclusions are presented in section 6.

2 The Econometric Framework

We estimate the following probit model of labor force participation (LFP):

$$LFP_{ij} = \begin{cases} 1 & \text{if } Y_{ij}^* > 0 \\ 0 & \text{if } Y_{ij}^* \leq 0 \end{cases} \quad (1)$$

where $Y_{ij}^* = X_{ij} \cdot \beta_j + u_{ij}$ is a latent (unobserved) variable which measures the net utility gain of labor force participation for woman i of country j ; $j = (b, s)$, b representing Britain and s for Spain; X_{ij} is the vector, for each woman i , of the variables thought to influence LFP¹; β_j is the vector of parameters, who measure the influence on LFP of each explanatory variable in X ; and u_{ij} are the error terms (assumed to be normally distributed).

The estimated probability that a female i of country j participates in the labor market is:

$$\hat{P}_{ij} = \Phi \left(X_{ij} \cdot \hat{\beta}_j \right), \quad (j = b, s) \quad (2)$$

where $\hat{\beta}_j$ is the probit estimate of the parameter vector β_j and Φ is the standard normal cumulative density function. Following Even and Macpherson (1990 and 1993), the average estimated probability of female LFP by country is given by:

$$\bar{P}_j = \frac{1}{N_j} \cdot \sum_{i=1}^{N_j} \Phi \left(X_{ij} \cdot \hat{\beta}_j \right), \quad (j = b, s) \quad (3)$$

where N_j is the number of women in the country j sample.

The estimated probability of LFP if there are no differences in response to characteristics across British and Spanish women is:

¹We follow the majority of authors investigating labour supply and adopt a standard static work-leisure tradeoff model (see Killingsworth 1983 and the recent survey in Blundell and Macurdy, 1999). Each individual is assumed to maximise a quasi-concave utility function $U(C, L, X)$ where C , L , X are consumption, leisure, and individual attributes respectively.

$$\bar{P}_o \equiv \frac{1}{N_s} \cdot \sum_{i=1}^{N_s} \Phi \left(X_{is} \cdot \hat{\beta}_b \right) \quad (4)$$

The British-Spanish women's LFP-gap can be decomposed into two terms:

$$\bar{P}_b - \bar{P}_s = \left(\bar{P}_b - \bar{P}_0 \right) + \left(\bar{P}_0 - \bar{P}_s \right) \quad (5)$$

where $\left(\bar{P}_b - \bar{P}_0 \right)$ represents the portion of the gap associated with differences in characteristics which are expected to influence labor force participation (the explained component of the gap); and $\left(\bar{P}_0 - \bar{P}_s \right)$ is associated with differences in the impacts (or responses) of those characteristics on the probability of labor force participation (the unexplained component of the gap).

The contribution that each individual explanatory variable k makes to the explained portion of the total gap is given by:

$$\bar{P}_{ek} = \left(\bar{P}_b - \bar{P}_0 \right) \cdot \left[\frac{\left(\bar{X}_b^k - \bar{X}_s^k \right) \cdot \hat{\beta}_b^k}{\left(\bar{X}_b - \bar{X}_s \right) \cdot \hat{\beta}_b} \right] \quad (6)$$

As discussed in Doiron and Riddell (1994), this procedure allocates shares according to the relative size of the explanatory variable's impact on participation².

3 Data

The data for the British families are taken from the 1990/91 General Household Survey (GHS). The GHS is an annual, multipurpose survey based on a sample

²Doiron and Riddell (1994) present an alternative decomposition which explicitly allows for curvature of the probability of the dependent variable (in their case unionisation). We also considered their decomposition and found little impact on our estimates (results are available on request from the authors). Applying Okum's Razor, we adopt the simpler decomposition.

of around 10,000 private households in Great Britain. Interviews are conducted with household members aged over 16. The 1990/91 year of this survey contains a unique section on household child care choices necessary for the estimation below.

For the Spanish families, the data has been obtained from the 1994/95 European Community Household Panel (ECHP). The ECHP survey provides comparable micro-level data to the GHS³, and interviews are similarly conducted with household members aged over 16. The 1994/95 sample is the earliest year of data for this survey

From both data sets, we select all families in which the parents are married or cohabiting, not self-employed, and in which there is at least one child aged under 12. Once removing those observations for which complete information is not available, we are left with 1531 families in the British sample and with 1113 in the Spanish.

The probit models of labor force participation (equation 2) that we estimate include the following explanatory variables in the vector X :

- variables describing the mother’s human capital: *age*, *age squared*, *university qualification for mother* (degree or higher), *college qualification for mother*;
- a variable referring to the father’s human capital: *university qualification for father*;
- variables reflecting opportunity cost: *family’s unearned income* (including father’s labor income), *and predicted net hourly wage* (for the mother);
- a variable reflecting the demand-side of the labor market: *unemployment* (regional unemployment rate);

³There is also a British sample in the ECHP. The sample size is, however, is too small to obtain consistent and efficient estimates in our model.

- variables describing the mother’s availability to participate in the labor market: *number of children aged under 5 years*, *number of children aged between 5 and 12 years*, *number of adults present in the household*, *grandparent present in the household*, *use of formal child care*, *use of informal child care only* (unpaid for care offered by friends and/or relatives)⁴;
- a variable referring to the father’s working arrangements: *father’s work pattern* (not working, working part-time or working full-time);
- a variable referring to the marital status of the mother: *cohabiting*.

Means are provided in Table 1 (fuller discussion of the data is included in an appendix available from the authors). In general, Spanish women are slightly older; more likely to be formally married; are better educated with fewer children; are less likely to use formal child care but are more likely to have other adults including grandparents living in their home; have substantially lower wages; and face higher regional unemployment rates than their British counterparts.

4 Estimation of the Probit Model of LFP

Results for the probit estimates are presented in Table 1⁵ (we report marginal effects rather than raw coefficient estimates, except for binary variables where differential effects are reported). Columns 1 through 3 of Table 1 provide results for Britain, whilst columns 4 to 6 are for Spain. The overall test of the explanatory power of the regressors is clearly significant for all the regressions and whilst the pseudo R^2 measures are not high, they are comparable with those

⁴In both countries, there are many women working who do not appear to be using child care, more so in Spain than Britain, this may be due to a view by survey respondents that child care provided by families members does not classify as informal child care.

⁵The reference group for our analysis are those mothers who are married; left education just after school; with a husband who did not go to university; are unemployed; have at least one child aged under 12; with families who do not use formal or informal child care; and do not have a grandparent living with them.

found in other studies of labor force participation (see Blundell and Macurdy, 1999). Overall, the parameter estimates are generally well defined and of the expected sign. We consider the results in more detail by addressing the impact of the right hand side variables in turn.

What matters most for labor force participation in our results are the positive impact of the mother's own wage; the positive impact of the use of child care (more so for formal child care than informal); and the negative effect of number of children in the household who are aged under 5 years old. These results are true for both British and Spanish women. To a lesser extent, both British and Spanish mothers are also less likely to participate in the labor market if their alternative sources of family income (including their partner's wage) are high.

For British women, we also found that older women are more likely to participate (although at a decreasing rate), as are women with partners working full time. Whereas university educated mothers in Britain are less likely to participate (18% less likely), so are those with university educated partners (12% less likely). This tendency of well educated women in developed countries to lower their labor force participation rates during their child bearing years has been recognized in several recent studies (Costas, 2000) and perhaps reflects the difficulty these women have finding child care of a similar quality to that they can provide themselves. The greater availability of family-friendly work practices such as extended maternity leave and career breaks may also encourage the lower participation of well educated mothers in Britain

In neither countries' estimates do the legal status of the partnership (married or cohabiting), the number of adults present in the household, the presence of grandparents, or the regional unemployment rate have a significant impact on the probability of the mother participating.

The average estimated probability of LFP for a married or cohabiting mother of children aged under 12 is 0.54 in Britain. In Spain that estimated probability

is, as expected, smaller at 0.32 (final row, Table 1). The total predicted LFP gap (the difference in estimated probabilities of LFP) between British and Spanish women is therefore 0.22. Of this gap, 0.28 (or 124%) is due to differences in observed characteristics and -.05 (or -24%) is due to different responses to these characteristics across the countries. In other words, if Spanish women had the same observed characteristics as British women their participation rates would exceed those of the Brits by almost 25%.

In addition to these general conclusions, we have also calculated the contribution of each explanatory variable to the explained portion of the LFP Gap (Table 1, column 7). As mentioned above, the own wage effect is very strong in our results. (In order to make allowance for only having wage information on working mothers, we estimated a predicted wage for all mothers by maximizing a full information likelihood function, Blundell and Macurdy, 1999⁶.) If we increased the log of the Spanish womens' average predicted wage by one unit (bringing it to a very similar mean value as for British women, which is equivalent to £3.64 per hour), the participation rate for Spanish women would rise by 0.21 percentage points, removing the majority of the LFP gap across the two nationalities. This is reflected in column 7 where the wage effect makes up 69% (0.19/0.28) of the explained portion of the gap. Similarly, the use of child care is related to 37% of this explained portion. Increasing the Spanish wage and levels of child care to those levels offered in Britain would, *ceteris paribus*, result in dramatic increases in the participation of Spanish women. In contrast, the total fall in participation amongst university educated mothers and those with university educated partners constitutes only some -6% of this portion.

The unexplained portion of the gap is more difficult to interpret (Jones, 1983) and could be due to many factors omitted from our analysis. For example, cultural and legal differences across countries will impact on the labor supply

⁶Discussion of this procedure and our results are included in the appendix available from the authors.

choices of mothers. These include the already briefly mentioned greater availability of family friendly work practices to British women; the possibly lower quality child care provision in Britain; and the comparatively recent large scale involvement of women in the Spanish labor market. As the process of integration continues across Europe, we would expect many of these differences to become further eroded.

5 Conclusions

We have found that married (or cohabiting) mothers of children aged under 12 in Spain are substantially less likely to participate in the labor market than are similar British mothers. The majority of the gap in their predicted participation gaps can, however, be explained predominantly by higher wages and greater child care use in Britain. If the process of unification across Europe leads to common working conditions being introduced in the two countries, we expect the size of this participation gap to fall dramatically generating many extra productive workers in Spain.

References

- [1] Becker, Gary. 1975. *Human Capital* 2nd Edition. University of Chicago Press, Chicago.
- [2] Blundell, Richard and Thomas Macurdy, 1999. 'Labor supply: A review of alternative approaches.' in Ashenfelter, O and Card, D. (Editors). *Handbook of Labor Economics* Volume 3a. Elsevier Science BV, Amsterdam.
- [3] Costa, Dora L., 2000. From mill town to board room: The rise of women's paid labor, *Journal of Economic Perspectives*, 14(4), 101-122.
- [4] Doiron, Denise J., and Craig W. Riddell. 1994. The impact of unionization on male-female earnings differences in Canada, *Journal of Human Resources*, 29(2), 504-534.

- [5] Even, William E., and David A. Macpherson. 1990, Plant size and the decline of unionism, *Economic Letters* 32, 393-398.
- [6] — 1993, The decline of private-sector unionism and the gender wage gap, *Journal of Human Resources*, 28(2), 279-296.
- [7] Jones, Francis .L. ,(1983).On decomposing the wage gap: A critical comment on Blinder's method.' *Journal of Human Resources*, 18(1), 127-130.
- [8] Killingsworth, Mark R., 1983. *Labour supply*. Cambridge University Press, Cambridge UK.
- [9] Oaxaca, Ronald. 1973, Male-female wage differentials in urban labor markets, *International Economic Review* 14(3), 693-709.

TABLE 1. Probit estimates of the determinants of mothers' labour force participation.

Variables	Britain			Spain			Decomposition
	effect	t value	mean	effect	t value	mean	$P_0 = P(X_b \hat{a}_b)$
mother's age	0.055	2.46**	33.09	0.023	0.92	35.30	-0.048
mother's age squared	-0.001	-2.15**	1135.01	-0.000	-1.13	1283.42	0.054
mother's university qualification	-0.178	-1.93*	0.07	0.117	0.88	0.19	-0.013
mother's college qualification	-0.026	-0.46	0.19	0.012	0.14	0.19	0.000
father's university qualification	-0.116	-2.53**	0.14	0.033	0.74	0.23	-0.003
ln(family unearned income)	-0.188	-6.02***	5.44	-0.074	-2.79***	5.13	-0.022
ln(mother's hourly wage)	0.442	3.49***	1.27	0.206	2.09**	0.29	0.193
regional unemployment rate	-0.003	0.29	8.44	-0.003	-1.00	23.56	0.052
number children aged under 5	-0.251	-8.86***	0.78	-0.117	-3.77***	0.52	-0.029
number children aged 5 to 12	-0.032	-1.54	1.74	-0.005	-0.18	1.47	-0.001
number adults present in household	-0.035	-0.99	2.14	0.038	1.60	2.44	-0.011
grand parent present in household	0.144	1.25	0.02	-0.053	-0.79	0.08	0.004
formal child care only	0.331	9.27***	0.35	0.431	8.65***	0.13	0.080
informal (unpaid) child care	0.293	7.25***	0.15	0.361	6.21***	0.08	0.023
father's work pattern	0.254	9.12***	1.70	0.019	0.65	1.71	0.000
mother cohabiting (not married)	-0.047	-0.84	0.08	0.017	0.16	0.02	0.001
Number of observations	1531			1113		Total explained	0.278
LR chi2(15)	452.04			283.77		Total unexplained	-0.054
Log likelihood	-829.05			-556.45		Total predicted gap	0.224
Pseudo R2	0.2142			0.2032			
obs. P	0.5447			0.3207			
pred. P (at x-bar)	0.5435			0.2921			

Marginal effects are reported except for binary regressors when differential effects are reported. *** significant at 99%, ** significant at 95%, * significant at 90%.